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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,050	08/17/2001	Yoshinori Atsumi	09792909-5142	4510

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EXAMINER
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DOVE, TRACY MAE

ART UNIT	PAPER NUMBER
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1795

MAIL DATE	DELIVERY MODE
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01/13/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/932,050	<b>Applicant(s)</b> ATSUMI ET AL.	
	<b>Examiner</b> TRACY DOVE	<b>Art Unit</b> 1795	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,4,15-18,23-31,33 and 34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,15-18,23-31,33 and 34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

This Office Action is in response to the communication filed on 11/9/09.

Applicant's arguments have been considered, but are not persuasive. Claims 1, 4, 15-18, 23-31, 33 and 34 are pending.

#### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/9/09 has been entered.

#### ***Claims Analysis***

Claims 1 and 4 recite a sintered mesophase carbon material prepared by sintering a mesophase carbon material after being molded into a body of the non-aqueous electrolyte secondary cell, which is not given patentable weight because it is a product-by-process limitation. The claim requires a sintered carbon material, in the absence of unexpected results regarding the process limitations. See MPEP 2113.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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Claims 1, 4, 15-18, 23-31, 33 and 34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1 and 4 recite a binderless anode comprising a sintered mesophase carbon material and an anode active material comprising Li and a tin or silicon containing metal material. The specification does not appear to disclose a sintered mesophase carbon material in combination with the claimed anode active material. The specification discloses the anode includes an active material capable of doping/dedoping lithium such as a sintered carbon material without a binder (page 6) OR a material comprising lithium and a tin or silicon containing metal material which forms an alloy or a compound with lithium (page 7). Example 2 of the present specification discloses "Mg<sub>2</sub>Si was mixed with mesophase carbon not sintered" (page 12).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, 15-18, 23-28, 30, 31, 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inamasu, JP 10-312789 in view of Moriguchi et al., US 6,576,369.

Inamasu teaches a nonaqueous electrolyte secondary battery comprising an active material phosphoric acid compound of the formula  $\text{Li}_x\text{FePO}_4$  (x depends of the valence of Fe) for the positive or negative electrode active material (0007,0011). Note iron has two possible valence states, 2+ or 3+, and phosphate has a 3- charge. Therefore,  $0 \leq x \leq 1$ . The  $\text{Li}_x\text{FePO}_4$  active material has an average grain size (particle diameter) of 0.1-100 nm (0020). Examiner points out that  $\text{Li}_x\text{FePO}_4$  is a preferred compound disclosed by the present specification on page 5. It is important to use a small active material to improve cycle characteristics of the battery (0007). When the phosphoric acid compound is used as the positive active material, the negative active material may be a carbon material such as graphite, lithium or a lithium alloy. Graphite intercalates (dopes) lithium (0018). Lithium metal, lithium alloy and carbon material are all typical materials used for the negative electrode active material of the nonaqueous secondary battery (0002-0004). The electrode materials may be baked (0021) or sintered (0023). The nonaqueous electrolyte may include an electrolyte solution comprising an organic solvent (e.g., propylene carbonate) and an electrolyte salt (e.g.,  $\text{LiClO}_4$ ) (0012).

The electrodes may include conductive agents, binders or fillers (0013). The electrodes are configured into a film-like structure (molded body) (0009). The negative electrode may include silicon or germanium (0018). Inamasu does not explicitly state the negative electrode material is a binderless sintered material. However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Inamasu teaches the anode optionally

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includes a binder (may or may not be present). One of skill would have known that sintered carbonaceous anode materials are generally formed without use of a binder, while non-sintered carbonaceous anode materials are generally formed with the use of a binder. Moriguchi US 6,576,369 teaches “in general, a graphite powder is applied to a metal base serving as a current collector with the aid of a suitable binder and is shaped thereon. Alternatively, a sintered electrode may be produced from the graphite powder without use of a binder” (15:31-38). One of skill would have known that sintering causes the particles to adhere (bind) together, thus negating the need for a binder. Inamasu teaches a sintered electrode material. Inamasu teaches a sintered electrode material.

Regarding claims 33 and 34, one of skill would have known that the electrodes could have been configured into any of a plurality of different shapes and sizes. Limitations merely limiting size and or shape are considered obvious in the absence of unexpected results.

The type of starting carbon material is considered obvious in view of the teachings of Inamasu. Product-by-process limitations, in the absence of unexpected results, are obvious.

### ***Response to Arguments***

Applicant's arguments filed 11/9/09 have been fully considered but they are not persuasive. Page 6 of the remarks states “claims 11 and 12 are new”, however, claims 11 and 12 are canceled. Regarding the new matter rejection, the specification does not appear to disclose a sintered mesophase carbon material in combination with the

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claimed anode active material.” The specification discloses the anode includes an active material capable of doping/dedoping lithium such as a sintered carbon material without a binder (page 6) **OR** a material comprising lithium and a tin or silicon containing metal material which forms an alloy or a compound with lithium (page 7). Example 2 of the present specification discloses “Mg<sub>2</sub>Si was mixed with mesophase carbon not sintered” (page 12). Examiner requests Applicant point out section of specification that discloses a sintered mesophase carbon material in combination with the anode active material of claims 1 and/or 4.

Applicant argues a binderless anode molded on the battery advantageously provides an increased anode active material filling density such that the anode has a large reaction area, thereby improving cell energy density and charge/discharge efficiency. However, evidence of unexpected results must distinguish the claimed invention over the prior art of record. Applicant asserts Inamasu is limited to an anode with a binder. This is incorrect. Inamasu teaches the electrodes may include conductive agents, binders or fillers (0013). Thus, Inamasu merely teaches a binder for the anode is optional. One of skill would have known that electrodes that are subjected to sintering are typically not formed using a binder. See page 7 of the present specification that discloses no binder is used for a sintered carbon material. Furthermore, Moriguchi US 6,576,369 teaches “in general, a graphite powder is applied to a metal base serving as a current collector with the aid of a suitable binder and is shaped thereon. Alternatively, a sintered electrode may be produced from the graphite powder without use of a binder” (15:31-38). One of skill would have known that

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sintering causes the particles to adhere (bind) together, thus negating the need for a binder.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday & Tuesday (9:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Tracy Dove/  
Primary Examiner, Art Unit 1795  
January 11, 2010